Remarks

Claims 1-9 and 29-31 were previously pending in the present application, where claims 10-28 were previously withdrawn from consideration in response to the restriction of December 26, 2002. By way of the foregoing amendment, claims 1-28 and 31 have been cancelled without prejudice or disclaimer. Applicants reserve the right to prosecute any of the cancelled/non-elected claims in the future. Claims 29 and 30 have been amended as is discussed below. Claims 32-40 have been added. Accordingly, claims 29, 30, and 32-40 are now pending.

Support for the claim amendments and new claims can be found in the originally filed specification, *inter alia*, at page 4, lines 31-32, page 6, line 11 – page 7, line 18 and page 8, line 28 – page 9, line 7, and the original claims. Accordingly, Applicants respectfully submit that no new matter has been added.

Amendments to the specification were made in light of the objections to the drawings, in order to clarify the arrangement of current sources for the signal source, as is discussed below.

Reconsideration of all outstanding objections and rejections is respectfully requested in light of the above amendments and in light of the comments that follow.

Information Disclosure Statement dated May 8, 2001

Applicants submitted an IDS on May 8, 2001, listing 15 references. To date, Applicants have not received a copy of the initialed Form FB-A820. Applicants note that the Examiner appears to have received the IDS and the attached references because the Examiner has applied the Kjebon reference, cited in that IDS. Accordingly, Applicants respectfully request the return of an initialed Form FB-A820 in order to ensure the completeness of their records.

Drawings

The drawings were objected to by the Examiner because the currents listed in the specification allegedly were not applied correctly to the drawing of Figure 1. Applicants have amended Fig. 1 to show the application of currents as is described by the specification.

In addition, Applicants have amended the specification to clarify the relationship of the current signals being applied to the light source. Applicants appreciate the Examiner's comments regarding any possible issues of clarity and hereby submit the above amended specification to clear up any possible ambiguities.

In the exemplary embodiment of Fig. 1, a distributed Bragg reflector (DBR) laser is being described. DBR lasers are known in the art, for example, as shown in the Kjebon reference of record. In Applicants' exemplary application of a DBR laser, Applicants send a DC current (identified as I_{DC} 16) to the gain section of the DBR laser in order to keep the laser operating above threshold. *See* original application, page 4, line 31, et seq. ("The laser is controlled in such a way as to modulate the center wavelength of the DBR section to generate a constant amplitude, frequency modulated (FM) optical wave. The laser is operated with a single longitudinal mode, and is not mode locked or gain switched. A bias current from a DC power supply 16 is applied to keep the laser above the lasing threshold at all times.").

In addition, two other signals are utilized and the combined signal is sent to the mirror section of the DBR laser to generate a frequency modified signal. First, in the exemplary embodiment of Fig. 1, a 0.5 GHz signal from a frequency synthesizer 12 is directed to the mirror section of the DBR laser via a bias tee 14. In addition, a bias current, now identified in amended Fig. 1 as bias current 15, is also sent to the mirror section of the DBR laser via bias tee 14. As is stated in the original specification, at page 5, line 11, et seq., "The bias current and modulation current were combined in the bias tee 14 from Picosecond Pulse Labs, Boulder CO. The resulting optical signal was frequency modulated with a modulation index of 52.5…."

Applicants respectfully submit that the original description of the DBR laser would be understood by one of ordinary skill in the art. However, Applicants provide the above noted changes in order to clear up any potential ambiguities.

Accordingly, Applicants respectfully request reconsideration of the drawing objection.

§ 102 Rejections

Claims 1-3, 7 and 29-31 were rejected under 35 USC § 102(b) as being anticipated by Harter (US 5,696,782). As claims 1-3, 7, and 31 were cancelled without prejudice, those rejections are now moot.

With respect to claims 29 and 30, Applicants respectfully submit that Harter does not anticipate these claims because Harter does not disclose, teach, or suggest a "constant amplitude, frequency modified" signal directed to a dispersive element. Also, Harter does not disclose, teach, or suggest "matching a chirp of the dispersive element with a cycle of the frequency

modulated signal," as is recited in amended claim 29. Furthermore, Harter does not teach or suggest the use of the claimed "long" fiber Bragg grating.

As is described in the specification, the "laser is controlled in such a way as to modulate the center wavelength of the DBR section to generate a constant amplitude, frequency modulated (FM) optical wave." (See page 4, lines 31-32). In other words, a constant amplitude, frequency modified signal is sent to the claimed dispersive element in order to generate a pulse train.

In contrast, Harter only suggests sending a pulsed signal to a fiber Bragg grating dispersive element. For example, Harter's Figs. 4-7 all show pulsed sources being sent to a compressor. See e.g., col. 7, line 22 et seq., "chirped pulses were obtained by frequency-chirping of the emission of tunable laser diode 600." While Harter mentions cw systems at col. 4, line 63, et seq., this mention is only in the context of providing cw amplification through conventional single mode fiber pumping schemes and double-clad fiber pumping schemes. Accordingly, Harter does not disclose, teach or suggest sending a constant amplitude, frequency modified pulse to a long fiber Bragg grating dispersive element.

Moreover, as Harter only addresses the compression of pulsed sources, Harter does not address or contemplate matching a chirp of the dispersive element with a cycle of the frequency modulated signal. As is described in the application (see page 7, lines 2-6):

> The efficiency could be made to approach the theoretical 50% for sinusoidal frequency modulation if the fiber Bragg grating were designed with the appropriate spatial chirp (spatial chirp refers to the property of a non-uniform Bragg grating which allows it to reflect different wavelengths at different positions along the grating - the spatial frequency of the grating planes is chirped).

According to an exemplary embodiment, the matching of the chirp of the dispersive element, here a long fiber Bragg grating, enables low repetition rate, which results in higher pulse energies and more optimized modulation signals, such as a sawtooth wave. See e.g., page 4, lines 27-29.

In contrast, Harter fails to disclose, teach, or suggest the above claimed "matching" feature. Instead, in Fig. 6, Harter only describes the use of a passively mode-locked fiber oscillator pulse-source that is fed to a compressor 670, which can be a diffraction grating pair or a chirped in-fiber Bragg grating. Harter is completely silent as to the step of matching a chirp to the cycle of an FM signal of the source (as is recited in amended claim 29) or the need for matching a high order dispersion component (as is recited in new claim 39). As such, the above-

noted feature is neither explicitly taught nor inherent in the method of Harter, mainly because Harter is not directed to generating a pulse train from a constant amplitude, frequency modified source.

Also, Harter describes the use of a 5 mm fiber Bragg grating. As is known in the art, a Bragg grating having a 5 mm length cannot be considered a "long" fiber Bragg grating. See e.g., M. Ibsen, et al., "Custom Design of Long Chirped Bragg Gratings: Application to Gain-Flattening Filter with Incorporated Dispersion Compensation," *IEEE Photonics Technology Letters*, Vol. 12, No. 5, May 2000, and Ibsen, et al., ""Long Continuously Chirped Fibre Bragg Gratings For Compensation Of Linear-And 3rd Order- Dispersion," *ECOC '97*, (copies of which are submitted herewith), which use "long" gratings of 10 cm and 1 meter, respectively, in length, over 20-200 times the length of the gratings used in Harter. Accordingly, Applicants respectfully submit that one of ordinary skill in the art would understand "long" gratings to mean gratings having a length of about 10 cm or longer.

Accordingly, Applicants respectfully submit that the rejection of claims 29-30 under 35 USC § 102(b) as being anticipated by Harter has been overcome and should be withdrawn.

Regarding new claims 32-40, as these claims add features to claim 29, Harter cannot anticipate these claims for at least the reasons stated above.

§ 103 Rejections

Claims 4-6 were rejected under 35 USC § 103(a) as being unpatentable over Harter in view of Eggleton (US 6,163,638). Claims 8-9 were rejected under 35 USC § 103(a) as being unpatentable over Harter in view of Kjebon. These rejections are now moot as claims 4-6 and 8-9 have been cancelled without prejudice.

Conclusion

In view of the above, it is respectfully submitted that the application is in condition for allowance. Reconsideration of the application is requested. Please contact the undersigned should there be any questions or in order to expedite prosecution.

Respectfully submitted,

9/16/03
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